

AMENDMENTS TO THE CLAIMS

1. (Previously Amended) An injection port adapted for use with an intravenous line, comprising:

a housing defining a flow channel and having an injection lumen extending in fluid communication with the flow channel;

first portions of the housing defining a first valve seat around the injection lumen;

second portions of the housing defining a second valve seat around the injection lumen;

a valve element disposed to extend transverse to the injection lumen;

the valve element forming a first seal with the first valve seat in response to a first pressure, the first pressure resulting from fluid in the flow channel;

the valve element forming a second seal with the second valve seat in response to a second pressure, the second pressure resulting from fluid in the flow channel, the second pressure greater than the first pressure of the fluid in the flow channel, and

the valve element forming an open configuration between said lumen and said flow channel in response to a third pressure resulting from fluid in the injection lumen in said lumen the third pressure greater than one of said first pressure and said second pressure.

2. (Original) The injection port recited in claim 1, further comprising:

third portions of the housing defining a third valve seat on the side of the valve element opposite the first and second valve seats; and

the valve element having properties for forming a third seal with the third valve seat.

3. (Original) The injection port recited in claim 2, wherein the valve element has properties for opening at least the first seal for said open configuration under the pressure of an injectate in the injection lumen to create a flow path around the valve element between the injection lumen and the flow channel; and

the valve element has properties for opening the third seal in response to a partial vacuum in the injection lumen to aspirate a portion of the fluid in the flow channel through an aperture in the valve element and into the injection lumen.

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Withdrawn) An injection/aspiration port adapted for operation with a male Luer fitting, comprising:

- a housing;

- first portions of the housing defining a flow channel;

- second portions of the housing defining an injection/aspiration lumen;

- third portions of the housing defining a valve seat around the injection/aspiration lumen;

- a valve element biased toward the injection/aspiration lumen and forming a seal with the valve seat;

- a valve cage disposed in the lumen and adapted to be moved by insertion of the male Luer fitting into the lumen against the valve element to open the seal and permit two-way flow between the lumen and the flow channel;

- a first body member comprising the second portions and third portions and defining the lumen and the valve seat, the lumen having an enlarged portion defining a shoulder against which the valve cage is biased when no male Luer is inserted; and

- a second body member comprising the first portions and forming the housing with the first body member, said second body member including portions contacting the valve element on the side of the valve element opposite the valve seat to bias the valve element against the valve seat to form the seal.

8. (Withdrawn) The injection/aspiration port recited in claim 7, wherein the valve cage is resilient, is biased to an expanded state, and is adapted to be compressed by the insertion of the male Luer, wherein the cage has properties for moving the valve only a small distance in response to the male Luer being inserted to any of a range of predetermined depths greater than said small distance.

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Withdrawn) A needleless access connection (NAC) in combination with a manifold having at least one injection port and adapted for use with an intravenous line, said combination comprising:

a housing with an upstream connection and a downstream connection, said housing having a first portion defining a flow channel between said upstream connection and said downstream connection;

said housing comprising a second portion integrally providing said NAC, said NAC having structure defining an injection and aspiration conduit, said second portion further providing an injection and aspiration aperture at one end of said NAC in fluid communication with the conduit;

said housing comprising a third portion integrally defining a grate having at least one opening at another end of said NAC and extending in fluid communication with said conduit and said flow channel for fluid injection into and aspiration from said flow channel;

an elongate valve element disposed in said second portion of said housing and naturally biased into engagement with the injection and aspiration aperture;

the elongate valve element having properties for naturally forming a first seal with the injection aperture; and

the valve element having properties for moving out of said aperture in response to insertion of a male Luer into said aperture, and for resiliently moving back into said aperture of said NAC when said male Luer is removed; and

said housing further comprising said at least one injection port in fluid communication with said flow channel.

21. (Withdrawn) The combination of claim 20, wherein said elongate valve element disposed in said second portion is also in abutting relation to said third portion.

22. (Canceled)

23. (Canceled)